This document replaces the October 1997 List of Approved Systems and Products.
Please discard any earlier versions you may have of this document.

Wastewater Management Program

List of Approved Systems and Products - *May 2001*

As Established in Chapter 246-272 WAC
On-site Sewage Systems

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List of Approved Systems and Products
Table of Contents

Introduction

This document replaces the October 1997 edition of the List of Approved Systems and Products.

Specific conditions for the use of each system technology or product are described in the Recommended Standards and Guidance (RS&G) documents relevant to the proprietary device. The most recently published edition of any RS&G can be obtained from local health offices and from the DOH website at the following Internet address: http://www.doh.wa.gov/ehp/ts/pubs.htm#wastewater.

Dimensional descriptions and performance data are included with the tables. This information is provided to facilitate equipment selection and promote proper application of the technology.

Suggestions to improve this document are always welcome. If you identify an error or have an idea to improve the usefulness of this document, feel free to contact staff in the Wastewater Management Program at the Washington State Department of Health, Office of Environmental Health and Safety (360-236-3062).

Overview: Conventional, Alternative, and Proprietary Technologies

A conventional on-site sewage system consists of a septic tank and gravity flow or pressure distribution to a gravel-filled drainfield. Any other on-site sewage treatment and/or disposal system is an "alternative" system. Alternative systems are reviewed with the assistance of the Technical Review Committee (TRC) and approved by the Washington State Department of Health (DOH). Upon approval, standards--performance, application, design, and operation and maintenance--and guidance are developed for implementing the specific technology. When standards or guidance exist for a particular type of alternative system, local health officers may issue permits for use of the alternative technology: these documents present the conditions to be met in the use of these sewage treatment and disposal systems.

A notable sub-category of alternative systems is the proprietary device or method. Proprietary devices or methods are those alternative systems or components thereof that are held under patent, trademark, or copyright. Before a local health officer may issue a permit for a proprietary product, it must be approved by the department. The manufacturer must submit information, specifications and performance data to the department for technical evaluation. Upon review and approval, the department lists the device or product on the List of Proprietary Systems and Products. Proprietary devices, products, or methods must be listed on the current list in order for local health officers to issue permits for their installation and use. If a certain manufacturer or product is not listed, or if a listed manufacturer's specific model number is not included on the list, the product IS NOT APPROVED for use in Washington State and may not be permitted by the local health officer.

Alternative Sewage System Descriptions

Aerobic Treatment Units

Aerobic treatment units provide aerobic biodegradation or decomposition of wastewater by bringing the wastewater in contact with air. These units come in different configurations and sizes, and incorporate a variety of mechanical (and non-mechanical) methods to enhance aerobic biodegradation of wastewater. Included are air pumps, air injectors, and biological-contact surfaces (such as pipes, fabric, grids, and rotating disks).

Typical Applications: Site soil that is poor for sewage treatment. Aerobic treatment units are less reliant upon existing original soil for treatment, but still dependent on the soil for disposal of the treated wastewater. High quality pre-treatment performance may allow reduced installed drainfield size to reduce the size and cost of initial installation.

Alternating and Dosing Systems

Dosing System: A system that employs a dose-rest cycle within a conventional gravity system by means of a dosing tank and a dosing device, such as a pump or siphon. The arrangement allows the dosing tank to fill to a predetermined level at which point the dosing device periodically discharges the volume contents to a drainfield or other approved disposal component.

Alternating Drainfields: Similar to dosing systems in that dose-rest cycles are provided. However, the rest cycle is long enough for complete drying and oxidation of the clogging layer. The flow from the pretreatment device is intermittently directed into two or more separate drainfields.

Typical Applications: Where continuous gravity flow is not feasible or desirable or where pressure distribution design is not used. Can be applied anywhere conventional drainfield design could be used.

Composting Toilets

Composting toilets are designed to store and compost, by aerobic bacterial digestion, human urine and feces, which are non-water-carried. Toilets may include necessary venting, piping, electrical, and/or mechanical components.

Typical Application: Where development area is limited. Separating, treating and disposing of grey-water and blackwater separately can have advantages: composting toilets can reduce total wastewater volume by about 50%, and greywater may be treated and disposed of through conventional or alternative means, depending upon site conditions, soil conditions, and scope of development.

Gravelless Drainfield Systems

A drainfield system using preformed structures or gravel-substitute to provide void space for passage and storage of effluent, and to provide an interface with the exposed infiltrative surface. These are functions performed by gravel in the conventional drainfield. Three types of systems are approved: gravelless pipe systems, gravelless chamber systems, and gravel-substitute systems. Site, soil, application, design and installation requirements differ for the three system types.

Typical Applications: Where cost or availability of gravel is a factor. Gravel is heavy and difficult to move by hand, but in some settings, use of large, heavy equipment is destructive to landscape, plantings, etc. Some materials / systems lend themselves well to root-level irrigation of shrubs, flowers, and trees.
Other applications would be where there is concern about fine materials entrained with gravel, and where there is a desire to access the infiltrative surface for monitoring and maintenance.

Holding Tank Sewage Systems

A water tight tank designed to hold the entire daily operational waste flow (plus reserve capacity) from an institutional or small commercial facility, together with controls, alarms and pump-out features to facilitate easy and reliable pumping of the sewage from the tank. These tanks are usually constructed of pre-cast concrete but may be fiberglass or polyethylene or poured-in-place concrete.

Typical Applications: Generally these options have limited application: parks, and recreational facilities, temporary or seasonal facility operation, etc., but may be useful in other settings depending on need, site limitations, and desired service intervals.

Incineration Toilets

Self-contained devices which reduce non-water-carried human urine and feces to ash and vapor, including the necessary venting, piping, electrical and/or mechanical components. The process is fueled by gas, fuel oil, or electricity.

Typical Applications: Where development area is limited. Separating, treating and disposing of grey-water and blackwater separately can have advantages: incineration toilets can reduce total wastewater volume by about 50%, and greywater may be treated and disposed of through conventional or alternative means, depending upon site conditions, soil conditions, and scope of development.

Mound Systems

These wastewater treatment systems are characterized by sand media (ASTM C-33) placed upon the ground surface, with effluent being treated before discharge from the sand media into the underlying soil. They share the principal attributes of intermittent sand filters except that the media is not contained within a structure. This technology is generally used at sites with shallow soil conditions over a restrictive layer or elevated groundwater table. Proper operation requires influent to be distributed over the media in controlled, discrete doses. In order to achieve accurate dosing, these systems require either a pump or siphon system with associated pump chambers, electrical components and distribution pipe-work. Current Recommended Standards and Guidance require the use of timed dosing of the effluent and timed resting periods.

Typical Applications: Site soil that is poor for sewage treatment. Mound systems are less reliant upon existing original soil for treatment, but still dependent on the soil for disposal of the treated wastewater.

Sand Filters

Wastewater treatment systems characterized by a relatively large container and means for distributing septic tank effluent atop a layer, or layers, of graded sand (or gravel) where, as the wastewater moves downward, it undergoes biochemical degradation. there are many different designs of sand filter, but they can generally be divided into two types: single-pass filters, and multiple-pass filter. The RS&G's for the sand filter technologies address three single-pass sand filters (intermittent, sand-lined drainfield trench, and stratified) and one multiple-pass filter (recirculating gravel filter system).

Typical Applications: Site soil poor for sewage treatment (systems are less reliant upon existing original soil for treatment, more for disposal of the treated wastewater). High quality pre-treatment performance may allow reduced installed drainfield size, meeting limited area constraints for some sites.

Vault and Pit Privies

A non-portable toilet enclosed in a vented outdoor structure. Vault privies have a waste storage chamber which is watertight or installed in impermeable material. Pit privies have a subsurface waste storage chamber that is not watertight.

Typical Applications: Generally these systems have limited application: parks and recreational facilities, temporary or seasonal facility operations, etc., but may be useful in other settings depending on need, site limitations, and desired service intervals.

List of Approved Systems and Products

The following pages present the current List of Approved Systems and Products for alternative systems . If a certain manufacturer or product is not listed, or if a listed manufacturer's specific model number is not included on the list, the product IS NOT APPROVED for use in Washington State and may not be permitted by the local health officer.

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Advanced Environmental Systems (AES) Bestep 10…..… 500 gpd	Advanced Environmental Systems, Inc. PO Box 89435 Sparks, NV 50356 Tel: (702)425-0911 Fax: (702) 425-0212	See Manufacturer	7-day: 17	7-day: 43	NOT TESTED
			30-day: 11	30-day: 14	
			full-test: 7	full-test: 15	
			R 30-day: --	R 30-day: --	
			NSF Standard #40, March 1995		
Alliance Wastewater Treatment System Alliance 500…….500 gpd	H.E. McGrew, Inc. 2835 Hollywood Avenue Suite 200 Shreveport, LA 71108 Tel: (318) 525-0122 Tel: (888) 746 5172 Fax: (318) 525-0125	See Manufacturer	7-day: 14	7-day: 24	NOT TESTED
			30-day: 12	30-day: 22	
			full-test: 6	full-test: 15	
			R30-day: --	R30-day: --	
			NSF Standard #40 January 1999		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Biomax Secondary Treatment System K6…….... . 400 gpd K8…….. 540 gpd K10……... ….680 gpd	Biomax Systems Jim Roundtree PO Box 2730 Belfair, WA 98528 Tel: (360) 275-3776 Fax: (360) 801-0777	Biomax Jim Roundtree PO Box 2730 Belfair, WA 98528 Tel: (360) 275-3776 Fax: (360) 801-0777	7-day: --	7-day: --	NOT TESTED
			30-day: --	30-day: --	
			full-test: 8.7	full-test: 5.6	
			R 30-day: 9.6	R 30-day: 6.3	
			NSF Standard #40, July 1990		
Cajun Aire CA00500 ……....500 gpd CA00750 ……....750 gpd CA001000……..…..1000 gpd	H.W. McGrew, Inc 2835 Hollywood Avenue Suite 200 Shreveport, LA 71108 Tel: (318) 525-0122 Tel: (888) 746 5172 Fax: (318) 525-0125	See Manufacturer	7-day: 26.59	7-day: 24.43	NOT TESTED
			30-day: 15.12	30-day: 14.54	
			full-test: 6.1	full-test: 5.3	
			R30-day: --	R30-day: --	
			NSF Standard #40 July 1990		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Clearstream Wastewater Treatment System *(Without Spinfilter Assembly)* 500N & 500NC……500 gpd 600N & 600NC……600 gpd 750N & 750NC……750 gpd 1000N & 1000NC…….1000 gpd 1500N & 1500NC…….1500 gpd.	Clearstream Wastewater Treatment Systems, Inc. PO Box 7568 Beaumont, TX 77626-7568 Tel: (409) 755-1500 Fax: (409) 755-6500	Selg & Associates 22224 Third Ave. SE Bothell, WA 98021 Tel: (425) 487-6059 Fax (425) 487-4086	7-day: --	7-day: --	NOT TESTED
			30-day: --	30-day: --	
			full-test: 6	full-test: 9	
			R 30-day: 9	R 30-day: 14	
			NSF Standard #40, March 1995, Pretreatment by 250 gallon septic tank		
Clearstream Wastewater Treatment System *(With – ES1100 Spinfilter Assembly)* 500N & 500NC……500 gpd 600N & 600NC……600 gpd 750N & 750NC……750 gpd 1000N & 1000NC…….1000 gpd 1500N & 1500NC…….1500 gpd.	Clearstream Wastewater Treatment Systems, Inc. Treatment Systems, Inc. PO Box 7568 Beaumont, TX 77626-7568 Tel: (409) 755-1500 Fax: (409) 755-6500	Selg & Associates 22224 Third Ave. SE Bothell, WA 98021 Tel: (425) 487-6059 Fax (425) 487-4086	7-day: --	7-day: --	NOT TESTED
			30-day: --	30-day: --	
			full-test: 5	full-test: 6	
			R 30-day: 7	R 30-day: 9	
			NSF Standard #40, March 1995, Pretreatment by 250 gallon septic tank		
Clearwater Ecological Systems CWW-450……450 gpd CWW-550…....550 gpd CWW-650……650 gpd CWW-750…....750 gpd CWW-1000…1000 gpd CWW-1250…1250 gpd CWW-1500…1500 gpd CWW-1750…1750 gpd CWW-2000…2000 gpd CWW-2500…2500 gpd CWW-3000…3000 gpd CWW-3500…3500 gpd	Clearwater Ecological Systems 3321 SE 20th Portland, OR 97202 Tel: (503) 233-8165 Fax: (503) 233-8231	See Manufacturer	7-day: 5	7-day: 8	NOT TESTED
			30-day: 5	30-day: 6	
			full-test: 5	full-test: 6	
			R 30-day: 7	R 30-day: 9	
			NSF Standard #40, July 1990 Pretreatment by 1000 gallon septic tank.		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Ekofinn Bioclere 16/12(BP3)……..….500 gpd 16/12 A ……..…1000 gpd 16/15……..…1500 gpd 16/19……..…2200 gpd 21/18……..…3000 gpd 12/21……..…3500 gpd	Address Unknown	See Manufacturer	7-day: 24 30-day: 17 full-test: 13 R 30-day: --	7-day: 36 30-day: 23 full-test: 13 R 30-day: --	NOT TESTED
			NSF Criteria #C-9, December 1988		
EnviroServer ENFG 600…….. .600 gpd ENFG 1200 ……..1200 gpd ENFG 1500 ……..1500 gpd	MicroSepTec Inc. 26601 Cabot Road Laguna Hills, CA 92653 Tel: (949) 367-8686 Fax: (949) 367-8655	See Manufacturer	7-day: 40 30-day 22 full test: 6 R30-day: --	7-day: 30 30-day: 16 full test: 8 R30-day: --	NOT TESTED
			NSF Standard #40, January, 1999		
FAST, Wastewater Treatment Systems Micro FAST--23-001-750…… 500 gpd Single Home FAST--23-001-1100…...750 gpd Single Home FAST--23-001-1350…...900 gpd	Bio-Microbics, Inc. 8450 Cole Parkway Shawnee, KS 66227 Tel: (800) 753-3278 Tel: (913) 422-0707 Fax: (913) 422-0808	Septic Solutions, Inc. 401 W. 13th Street Vancouver, WA 98660 Tel: (360) 699-2330 Fax.: (360) 699-2389	7-day: 14 30-day: 12 full-test: 9 R 30-day: 10	7-day: 12 30-day: 8 full-test: 7 R 30-day: 10	NOT TESTED
			NSF Standard #40, July 1990		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
FAST, Wastewater Treatment Systems MicroFast 0.9 ……900 gpd MicroFast 1.5 ……1500 gpd MicroFast 3.0 ……3000 gpd	Bio-Microbics, Inc. 8450 Cole Parkway Shawnee, KS 66227 Tel: (800) 753-3278 Tel: (913) 422-0707 Fax: (913) 422-0808	Septic Solutions, Inc. 401 W. 13th Street Vancouver, WA 98660 Tel: (360) 699-2330 Fax.: (360) 699-2389	7-day: 14 30-day: 12 full test: 9 R 30-day: 10	7-day: 12 30-day: 8 full test: 7 R 30-day: 10	NOT TESTED
			NSF Standard #40, July 1990		
Five Star 505 KA 505KA ……500 gpd	Five Star Environmental Systems, Inc. PO Box 1768 Kingston, WA 98346-1768 Tel: (360) 297-3633 Fax: (360) 297-3636	See Manu-facturer *** Note:** ***** 7 & * 30 day averages are calculated from worst day values throughout the entire test.	***** 7-day: 29 ***** 30-day: 20 full-test: 12 R 30-day: --	***** 7-day: 31 ***** 30-day: 20 full test: 6 R30-day: --	NOT TESTED
			NSF Standard #40, October 1980		
Hydro-Action G-500……500 gpd G-900……900 gpd G-1000……1000 gpd G-1100……1100 gpd G-1500……1500 gpd	Hydro-Action 5131 Wilson Road Kountze, TX 77625-0426 Tel: (409) 246-3749 Fax: (409) 246-2481	Precise Water & Waste, LTD. #565-1027 Davie Street Vancouver, BC V6E4L2 Tel: (604) 328-0778 Fax: (604) 328-8252	7-day: 15 30-day: 12 full-test: 10 R 30-day: 12	7-day: 17 30-day: 12 full-test: 9 R 30-day: 12	NOT TESTED
			NSF Standard #40, July 1990 Pretreatment by 250 gallon septic tank.		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Jet Aeration Home Aerobic Plant J-500……..500 gpd J-750……..750 gpd J-1000……1000 gpd J-1250……1250 gpd J-1500……1500 gpd	Jet, Inc. 750 Alpha Drive Cleveland, OH 44143 Tel: (216) 461-2000 Fax: (216) 442-9008	Cascade Septic service PO Box 247 2171 School Drive Clearlake, WA 98236 Tel: (253) 856-0681 Fax: (253) 856-0681	7-day: 23	7-day: 22	NOT TESTED
			30-day: 19	30-day: 17	
			full-test: 15	full-test: 12	
		Aerobic Wastewater Treatment & Recycling, Inc. PO Box 1234 53635 Bercot Road Freeland, WA 98249 Tel: (360) 331-1399 Fax: (360) 331-2462	R 30-day: 13	R 30-day: 12	
			NSF Standard #40, July 1990		
Klargester BIODISC Rotating Biological Contactor Systems BF-1-450 ..... 450 gpd BF-2-700 ..... 700 gpd BF-3-1100..... 1100 gpd BF-4-1500..... 1500 gpd BF-5-3500..... 3500 gpd BC-1-450 ..... 450 gpd BC-1-500 ..... 500 gpd BC-1-600 ..... 600 gpd BC-2-750 ..... 750 gpd BC-3-1100 ..... 1100 gpd BC-4-1500 ..... 1500 gpd BC-4-2500 ..... 2500 gpd BC-5-3500 ..... 3500 gpd	Klargester, Inc. 3238 Old Fence Road Ellicott City, MD 21042 Tel: (410) 480-0272 Fax: (410) 480-0282	Selg & Associates 22224 Third Avenue SE Bothell, WA 98021 Tel: (425) 487-6059 Fax (425) 487-4086	7-day: 27	7-day: 20	NOT TESTED
			30-day: 21	30-day: 15	
			full-test: 15	full-test: 10	
			R 30-day: --	R 30-day: --	
			NSF Standard #40, May 1983		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Mighty Mac 5080S ……..500 gpd 5100S ……..600 gpd 5120S ……..750 gpd	H.E. McGrew, Inc. 2835 Hollywood Avenue Suite 200 Shreveport, LA 71108 Tel: (318) 525-0122 Tel: (888) 746 5172 Fax: (318) 525-0125	See Manufacturer	7-day: 24	7-day: 41	NOT TESTED
			30-day: 11	30-day: 20	
			full test: 7	full test: 13	
			R 30-day: --	R30-day: --	
			NSF Standard #40, May 1996		
Multi-Flo Waste Treatment Systems FTB-0.5……..500 gpd FTB-0.6……..600 gpd FTB-0.75……750 gpd FTB-1.0……1000 gpd FTB-1.5……1500 gpd	Consolidated Treatment Systems 1501 Commerce Ctr. Dr. Franklin, OH 45005 Tel: (513) 746-2727 Fax: (513) 746-1446	Evergreen Multi-Flo 5636 Lenz Place Langley, WA 98260 Tel: (206) 321-4030 Fax: (206) 321-4797	7-day: 5	7-day: 6	NOT TESTED
			30-day: 5	30-day: 5	
			full-test: 5	full-test: 5	
			R 30-day: <5	R 30-day: <5	
			NSF Standard #40, July 1990		
Nayadic Residential Sewage Treatment System M-6A-F/M-6 .....500 gpd M-6A-C/M-6AC-F.....500 gpd M-8A-F/M-8A. .....600 gpd M-1050-F/M-1050A .....800 gpd M-1200-F/M-1200A .....1000 gpd M-2000-F/M-2000A .....1500 gpd	Consolidated Treatment Systems 1501 Commerce Ctr. Dr. Franklin, OH 45005 Tel: (513) 746-2727 Fax: (513) 746-1446	See Manufacturer	7-day: 9	7-day: 12	NOT TESTED
			30-day: 8	30-day: 8	
			full-test: 6	full-test: 7	
			R 30-day: 8	R 30-day: 8	
			NSF Standard #40, July 1990		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Singular Individual Home Wastewater Treatment System. **(900 series)** (**Note:** These models are different from the models listed below) 900-500 ..... 500 gpd 900-750 ..... 750 gpd 900-1000 ..... 1000 gpd 900-1250 ..... 1250 gpd 900-1500 ..... 1500 gpd	Norweco Wastewater Equipment Co. 220 Republic Street Norwalk, OH 44857-1196 Tel: (419) 668-4471 Fax: (419) 663-5440	See Manufacturer	7-day: 20	7-day: 28	NOT TESTED
			30-day: 18	30-day: 13	
			full-test: 13	full-test: 18	
			R 30-day: --	R 30-day: --	
			NSF Standard #40, July 1990		
Singular Individual Home Wastewater Treatment System. **(960 series)** (**Note:** These models are different from the models listed above) 960-500 ..... 500 gpd 960-750 ..... .750 gpd 960-1000 ..... 1000 gpd 960-1250 ..... 1250 gpd 960-1500 ..... 1500 gpd	Norweco Wastewater Equipment Co. 220 Republic Street Norwalk, OH 44857-1196 Tel: (419) 668-4471 Fax: (419) 663-5440	See Manufacturer	7-day: 10	7-day: 9	NOT TESTED
			30-day: 8	30-day: 13	
			full-test: 6	full-test: 10	
			R 30-day: 6	R 30-day: 10	
			NSF Standard #40, May 1996		
TRD-1000 TRD-1000-500..... 500 gpd TRD-1000-600..... 600 gpd TRD-1000-700..... 700 gpd TRD-1000-800..... 800 gpd TRD-1000-900..... 900 gpd TRD-1000-1000..... 1000 gpd	Thomas, Inc. On-site Wastewater Treatment Systems 2507 HWY 20 Sedro Woolley, WA 98284 Tel: (360) 856-0550	See Manufacturer	7-day: 5	7-day: 5	
			30-day: 3	30-day: 3	
			full-test: 3	full-test: 3	
			R 30-day: 3	R 30-day: 3	R 30-day: 47
			NSF Standard #40, July 1997		

Aerobic Treatment Units (Residential) / Performance Characteristics

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality		
			30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (maximum average, mg/l)**	**TSS (maximum average, mg/l)**	**Fecal Coliform (geometric mean, colonies/100 ml.)**
Whitewater Aerobic Treatment Unit DF40-CF..... 400 gpd DF40-FF ..... 400 gpd DF40-CC ..... 400 gpd DF50-CF..... 500 gpd DF50-FF ..... 500 gpd DF50-CC ..... 500 gpd DF60-CF..... 600 gpd DF60-FF ..... 600 gpd DF60-CC ..... 600 gpd DF75-CF ..... 750 gpd DF75-FF..... 750 gpd DF75-CC..... 750 gpd DF100-CF . 1000 gpd DF100-FF.. 1000 gpd DF100-CC. 1000 gpd DF150-CF . 1500 gpd DF150-FF.. 1500 gpd DF150-CC. 1500 gpd	Delta Environmental Products, Inc. 8275 Florida Blvd. East PO Box 969 Denham Springs, LA 70727 Tel: (504) 665-1666 Fax: (504) 665-1855	Keystone Engineering PO Box 360 Black Diamond, WA 98010 Tel: (360) 886-1396 Fax: (360) 886-2480	7-day: 14 30-day: 8 full-test: 6 R 30-day: 10	7-day: 14 30-day: 8 full-test: 7 R 30-day: 6	NOT TESTED
			NSF Standard #40, July 1990		
Whitewater Aerobic Treatment Units in combination with the UV "The Disinfector", unit. DF-50…….500 gpd	Delta Environmental Products, Inc. P.O. Box 969 Denham Springs, LA 70727 Tel: (504) 665-1666 Fax: (504) 665-1855	Keystone Engineering PO Box 360 Black Diamond, WA 98010 Tel: (360) 886-1396 Fax: (360) 886-2480	7-day: 14 30-day: 8 full test: 6 R30-day: --	7-day: 14 30-day: 8 full test: 7 R30-day: --	 30-day: 193
			NSF Standard #40, May 1996		

Aerobic Treatment Units (Non – Residential) / Performance Characteristics

Product Information			Influent and Treated Effluent Quality			
Name / Models	**Manufacturer**	**Representative**	**BOD_5 (average, mg/l)**		**TSS (average, mg/l)**	
			Influent	**Effluent**	**Influent**	**Effluent**
Nibbler Sewage Treatment System CW-1000…….234 gpd., 2000 mg/l BOD CW-1750……..350 gpd., 2000 mg/l BOD CW-2000……..700 gpd., 2000 mg/l BOD	NCS Wastewater Solutions, LLC Northwest Cascade-Stuth PO Box 73399 Puyallup, WA 98373 Tel: (800) 444-2371 Fax: (253) 840-0877	See Manufacturer	full test = 1523	full test = 167	full test = 867	full test = 119

Composting Toilets

Name/Model/Loading	Manufacturer		Representative	
	Address	Phone/Fax #'s	Address	Phone/Fax #'s
Biolet Composting Toilet XL…..4-person residential UFA…4-person residential	Biolet U.S.A, Inc. 45 Newbury Street, Suite 306 Boston, MA 02116	Tel: (800) 524-6538 Tel: (617) 578-0435 Fax: (617) 578-0465	Thurman Industries 12612 NE 124th Street Kirkland, WA 98034	Tel: (425) 823-4004 Fax: (425) 823-5560
			McLendon Hardware 10210 16th Ave SW Seattle, WA 98146	Tel: (206) 762-4090
Carousel Composting Toilet 80-A……..4-person residential	Ecotech 152 Commonwealth Ave. Concord, MA 01742-2943	Tel: (508) 369-3951 Fax: (508) 369-2484 E-mail: watercon@lgc.org	See Manufacturer	
Clivus Multrum Composting Toilet M-12…..80 uses/day M-15…100 uses/day M-18…120 uses/day M-22…. 80 uses/day M-25…100 uses/day M-28…120 uses/day M-32…110 uses/day M-35…180 uses/day	Clivus Multrum, Inc. 15 Union Street Lawrence, MA 01840	Tel: (800) 425-4887 Fax: (508) 557-9658	Enviro-Safe 110 View Ridge Circle Wenatchee, WA 98801	Tel: (509) 663-3296 Fax: (509) 663-3296
Composting Toilet System, Inc. CTS-410……..4-person residential CTS-710……..7-person residential CTS-904……60 uses/day CTS-914…..120 uses/day CTS-1010…10-person residential (75 uses/day)	Composting Toilet Systems, Inc. PO Box 1928 Newport, WA 99156-1928	Tel: (888) 786-4538 Tel: (509) 447-3708 Fax: (509) 447-3708 E-mail: cts@povn.com	See Manufacturer	

Composting Toilets

Name/Model/Loading	Manufacturer		Representative	
	Address	**Phone/Fax #'s**	**Address**	**Phone/Fax #'s**
Envirolet Composting Toilet MS10 (110v) …….. 6-person residential RS2W110(110v)…….. 8-person residential DC12 (12v)…….. 4-person residential RS2W12(12v)…… 6-person residential Basic Plus (NE)…… 2-person residential RS2WNE (NE)…… 4-person residential	Sancor Industries 140-30 Milner Ave Scarborough, Ontario, Canada M1S 3R3	Tel: (800) 387-5126 Tel: (416) 299-4818 Fax: (416) 299-3124	See Manufacturer	
Phoenix Composting Toilet PF-199…….2-person residential PF-200…….4-person residential PF-201……..8-person residential (50 uses/day)	Advanced Composting Systems 195 Meadows Road Whitefish, MT 59937	Tel: (406) 862-3854 Fax: (406) 862-3855	Water-Wise 2131 East Middle Drive Freeland, WA 98249	Tel: (206) 730-7992
Sun-Mar Composting Toilet X.L. (Excel)…….. 3-person residential Centrex A/F…… 4-person residential Centrex A/F AC/DC…. 3-person residential Centrex Plus A/F……. 5-person residential Centrex Plus A/F AC/DC…….. 4-person-residential Compact…… 1-person residential Ecolet 110…… 1-person residential Ecolet M/RV …… 1-person residential Excel NE…….. 2-person residential	Sun-Mar Corporation 5035 North Service Road, C9 Burlington, Ontario, Canada L7L 5V2	Tel: (800) 461-2461 Tel: (905) 332-1314 Fax: (905) 332-1315 E-mail: compost@sunmar.com	Enviro-Safe 110 View Ridge Circle Wenatchee, WA 98801	Tel: (509) 663-3296 Fax: (509) 663-3296
			Composting Toilet Systems PO Box 1928 Newport, WA 99156-1928	Tel: (888) 786-4538 Tel: (509) 447-3708 Fax: (509) 447-3753 Fax: (509) 447-3708

Vault Toilets

Name/Model/Loading	Manufacturer		Representative	
	Address	Phone/Fax #'s	Address	Phone/Fax #'s
CXT Aspen Mark 11 .....1000 gal Gunnison.....1000 gal Sierra.....1000 gal Tioga. .....2000 gal Tioga Special.....2000 gal Vail .....1000 gal	CXT Inc. 3808 North Sullivan Road, Bldg. #7 Spokane, WA 99216	Tel: (800) 696-5766 Tel: (509) 921-8766 Fax: (509) 928-8270	See Manufacturer	See Manufacturer
Romtec (750 or 1,000 gallon vaults) SST……Original Restroom SST……Traditional Restroom SST……Aspen Wood Design Single Restroom SST……Double Restroom Wood Design SST……Aspen Concrete Single Restroom SST……Aspen Concrete Double Restroom	Romtec, Inc. 18240 North Bank Road Roseburg, OR 97470	Tel: (541) 496-3541 Fax: (541) 496-0803 E-mail: romtec@rosenet.net	See Manufacturer	See Manufacturer

IncinerationToilets

Name/Model/Loading	Manufacturer		Representative	
	Address	Phone/Fax #'s	Address	Phone/Fax #'s
Storburn Gas-Fired Incinerator Toilet 60 KP……..Propane……6-8 person 60 KN……..Natural Gas……..6-8 person	Storburn International, Inc. 47 Copernicus Blvd Unit 3 Brantford, Ontario N3P 1NA Canada	Tel: (800) 876-2286 Tel: (519) 752-8521 Fax: (519) 752-5827 E-mail: storburn@sympalco.com		
Incinolet – Electric Incinerator Toilet CF…….120 volt……4-person TR…….240 volt……8-person WB……120/240 volt…….4/8 -person	Research Products/ Blankenship 26 Andjon Dallas, TX 75220	Tel: (800) 527-5551 Tel: (214) 356-4238 Fax: (214) 350-7919	See Manufacturer	See Manufacturer

Sand Filters

Performance calculated according to NSF Standard 40 Protocol

Product Information			Treated Effluent Quality 30-day = Consecutive 30-day average, R-30 = Running 30-day average		
Name / Models	**Manufacturer**	**Representative**	**BOD_5** (maximum average, mg/l)	**TSS** (maximum average, mg/l)	**Fecal Coliform** (geometric mean, organisms/100 ml.)
Alternating Intermittent Recirculating Reactor-AIRR (Classified as a Recirculating Sand [Gravel] Filter). Maximum design volume loading rate is 5-gallons/day/ft^2 residential strength.	Spec Industries, Inc 550 Parkson Road Henderson, NV 89015 Tel: (702) 558-4444 Fax: (702) 558-4563	DDG Engineering Inc. PO Box 244 Marysville, WA 98270 Tel: (306) 658-9836	7-day: --	7-day: --	8.5×10^3
			30-day: --	30-day: --	
			full-test: 3	full-test: 4	
			R 30-day: --	R 30-day: --	
			Final Report, Oregon On-Site Experimental Systems Program Results, Dec. 1982, pages 2-9.		
Glendon BioFilter Treatment System M3……..240 - 480 gpd* M31……. 90 - 528 gpd* *Multiple units, in the same or a variety of sizes, may be used in parallel to accomplish daily design flows to 1,500 gpd.	Glendon BioFilter Technologies 25448 Port Gamble Rd Poulsbo, WA 98370 Tel: (360) 297-7066 Fax: (360) 297-8479	See Manufacturer	7-day: --	7-day: --	
			30-day: --	30-day: --	
			full-test: --	full-test: --	
			R 30-day: 5	R 30-day: 6	R 30-day: 2
			DOH Experimental Program. Adaptation of NSF Standard #40, 1990 and C-9		

Gravelless Drainfield Systems / Gravelless Chamber Products

Note: Infiltrative surface area is calculated from outside dimensions. actual area may be less for some products due to support pads and dimensional variation.

Product / Model	Unit Size W / L / H (inches)	Void Space per unit (cu. ft.)	Void Space per linear foot (cu. ft)	Infiltrative Surface per unit (sq. ft.)	Infiltrative Surface per linear foot (sq. ft.)	Manufacturer	Representative
Bio-Diffuser Plastic Leaching Chamber System						PSA, Inc. PO Box 218902 Columbus, OH Tel: (614) 457-3051 Fax: (614) 538-5204	Advanced Drainage System, Inc. 627 South 37th Street Washougal, WA 98671 Tel: (360) 835-8523 Fax: (360) 835-3823
Standard (14")	34" x 76" x 14"	14.0	2.25	17.9	2.8		
Low Profile (11")	34" x 76" x 11"	8.5	1.36	17.9	2.8		
Bio 2	12.7" x 86.9" x 11.9"	5.0	0.7	9.0	1.3		
Bio 3	17.7" x 86.9" x 11.9"	8.6	1.2	13.2	1.8		
Cultec Field Panel System						Cultec, Inc. 878 Federal Road Brookfield, CT 06804 Tel: (800) 4CULTEC Tel: (203) 775-4416 Fax: (203) 775-1462	See Manufacturer
C1 Field Drain Contactor	12" x 96" x 8.5"	3.4	0.4	8.0	1.0		
C2 Field Drain Contactor	24" x 96" x 8.5"	6.7	0.8	16.0	2.0		
C3 Field Drain Contactor	36" x 96" x 8.5"	10.1	1.3	24.0	3.0		
C4 Field Drain Contactor	48" x 96" x 8.5"	13.4	1.7	32.0	4.0		
Contactor 75	26.5" x 75" x 12.4"	10.0	1.6	13.8	2.2		
Contactor 100	36" x 75" x 12.5"	13.3	2.1	18.8	3.0		
Contactor 125	28" x 78" x 18.0"	16.7	2.7	14.6	2.3		
Recharger 330	52" x 75" x 30.5"	55.6	8.9	27.1	4.3		

Gravelless Drainfield Systems / Gravelless Chamber Products

Note: Infiltrative surface area is calculated from outside dimensions. actual area may be less for some products due to support pads and dimensional variation.

Product / Model	Unit Size W / L / H (inches)	Void Space per unit (cu. ft.)	Void Space per linear foot (cu. ft)	Infiltrative Surface per unit (sq. ft.)	Infiltrative Surface per linear foot (sq. ft.)	Manufacturer	Representative
EnviroChamber Leaching System						Hancor, Inc. PO Box 1047 Findlay, OH 45839-1047 Tel: (419) 422-6521 Fax: (419) 424-8300	See Manufacturer
Standard	34” x 75” x 12”	11.63	1.85	17.7	2.8		
High Capacity	34” x 75” x 17.5”	18.3	2.93	17.7	2.8		
Infiltrator Chamber Leach Field System						Infiltrator Systems, Inc. 4 Business Park Road Old Saybrook, CT 06475 Tel: (860) 388-6639 Fax: (860) 388-6810	Wm. A. Matzke Company, Inc. 1804 South Bush Place Seattle, WA 98144 Tel: (206) 323-4350 Fax: (206) 325-7644
Standard	34” x 75” x 12”	10.3	1.65	17.7	2.8		
High Capacity	34” x 75” x 16”	16.3	2.61	17.7	2.8		
Equalizer 24	15” x 101” x 11”	4.45	0.54	10.5	1.3		
Equalizer 36	22” x 101” x 11”	8.42	1.00	15.4	1.8		

Gravelless Drainfield Systems / Gravelless Drainfield Pipe Products

Product / Model	Unit Size OD / L (inches)	Void Space per unit (cu. ft.)	Void Space per linear foot (cu. ft)	Infiltrative Surface per unit (sq. ft.)	Infiltrative Surface per linear foot (sq. ft.)	Manufacturer	Representative
Goldline GLP Gravelless Leachbed Pipe						Prinsco, Inc. PO Box 265 Prinsburg, MN 56281 Tel: (800) 992-1725 Fax: (612) 978-8602	Ron Meyer & Associates 8885 SW Canyon Road Suite 216 Portland, OR 97225 Tel: (503) 297-2096 Fax: (503) 297-3339
GLP 8	9.5” OD x 120”	4.9	0.49	7.9	0.8		
GLP 9	11.6” OD x 120”	7.3	0.73	9.7	1.0		

Gravelless Drainfield Systems / Gravel Substitute Products

Product / Model	Unit Size W / L / H (inches)	Void Space per foot^3 of media (cu. ft)	Void Space per arrangement of units (cu. ft)	Void Space per linear foot of trench (cu. ft)	Infiltrative Surface per arrangement of units (sq. ft.)	Infiltrative Surface per linear foot (sq. ft.)	Manufacturer	Representative
EZflow systems							EZ*flow* 65 Industrial Park Road Oakland, TN 38060 Tel: (901) 465-1159 Fax: (901) 465-1181	Alex Mauck EZ*flow* 931 NE Harlow Place Troutdale, OR 97060 Tel: (503) 492-2900 Fax: (503) 492-0208
2003-H	10” x 30” x 120” Horizontal arrangement of three 10” diameter “tubes” in a 30” wide trench.	0.44	7.2	0.72	25	2.5		
2003-T	10” x 24” x 120” Triangular arrangement of three 10” diameter “tubes” in 24” wide trench.	0.4	7.2	0.72	20	2.0		
2012-H	12” x 36” x 120” Horizontal arrangement of three 12” diameter “tubes” in a 36” wide trench.	0.4	10.1	1.01	30	3.0		

Overview: Applying Performance Standards to Marginal Sites using Alternative On-site Sewage Treatment Systems

To strike a balance between site conditions and development plans, and between public health and environmental protection, the current State Board of Health (SBOH) rules for on-site sewage systems have integrated the concepts of using performance standards and using various types of sewage treatment and disposal systems.

- For sites and development plans consistent with the minimum standards for conventional sewage systems, the rules as presented in Chapter 246-272 WAC are applied.
- For sites where all conditions can be met except for vertical separation, pressure distribution in the drainfield may be substituted for up to 12 inches of vertical separation to retain the balance needed.
- For other more marginal situations, or sites where the desired development raises health protection issues to be addressed by the system designer, the rules employ use of two performance standards: Treatment Standard 1 (TS1) and Treatment Standard 2 (TS2).

Treatment Standards 1 and 2

Standard	Treated effluent from Alternative On-site Sewage Systems must meet (or exceed) these performance standards:		
	BOD_5 (5-day Biochemical Oxygen Demand) Maximum 30-day average (mg BOD / liter Effluent)	TSS (Total Suspended Solids) Maximum 30-day average (mg TSS / liter Effluent)	Fecal Coliform Maximum 30-day geometric mean, (Colonies/100 ml Effluent)
Treatment Standard 1:	**< 10 mg ***	**< 10 mg**	**< 200**
Treatment Standard 2:	**< 10 mg ***	**< 10 mg**	**< 800**

***** A 30 day average of less than 8.3 mg /L of carbonaceous biochemical oxygen demand (5-day $CBOD_5$) will be accepted in lieu of the BOD_5 value when data are submitted in the course of NSF Standard No. 40 testing and reporting protocols.

The concept of integrating performance standards with on-site sewage systems management began when the SBOH, in response to legislative action, adopted amendments and additions to Chapter 246-272 WAC. These performance standards, which became effective 11/10/89, only applied to repair and replacing on-site sewage system failures along marine shorelines. To address lot size and soil limitations often found at these sites, the amendments introduced the concept of TS1 and TS2, and linked the use of systems capable of meeting these standards to address limited vertical and horizontal separation situations. When the State Board of Health revised the on-site sewage system rules on January 1, 1995, this concept was expanded to apply the two performance standards beyond repair of marine shoreline system failures to protect vulnerable waters throughout the state.

Application of Treatment Standards		
Permit Event	**System Must Meet Treatment Standard**	**Applies When & Where:**
Repair or Replacement	1 or 2	Horizontal separation to a water supply or surface water cannot meet the standards for new construction.[1]
New Construction or Expansion	2	• Vertical separation is less than 2 feet in Soil Types 1B, 2A & B, and 3-6.[2] • Development where Soil Type 1A exists. [3]

[1] Table VI in the SBOH rules, Chapter 246-272 WAC
[2] Table IV in the SBOH rules, Chapter 246-272 WAC
[3] Table IV in the SBOH rules and Table VII in the SBOH rules, Chapter 246-272 WAC

Treatment Standards 1 and 2 are applied to existing and new sites *indirectly*:

- The Department of Health (DOH) reviews the performance data of alternative on-site sewage treatment systems and identifies those meeting parameters of the two standards. At least annually, DOH prepares a list of these systems and products.

- Certain site conditions determine the need for an on-site sewage system to meet Treatment Standard 1 or 2. Systems and products meeting the performance standards may be used at these conditional sites without further evaluation of the treatment system's performance.

- Appropriate design, installation and inspection, followed by proper operation by the system's owner and routine monitoring and maintenance by qualified service providers support presumption of satisfactory performance.

Treatment Standard 1 and 2 are stringent wastewater treatment standards. Not all systems or products meet the standards.

- Performance results of some systems may qualify in two, but not all three, of the performance parameters. An example of this exists with the intermittent sand filter. Its performance level meets all the parameters of Treatment Standard 2, but meets only the BOD5 and TSS parameters of Treatment Standard 1. The effluent fecal coliform count exceeds Treatment Standard 1 criteria, and therefore does not qualify for TS1.

- For some systems or products that have been researched or tested, effluent samples were analyzed for only two, instead of all three of the parameters. An example of this exists with some aerobic treatment units that have been performance-tested according to the National Sanitation Foundation (NSF) Standard No. 40. This testing protocol evaluates products for BOD_5 ($CBOD_5$) and TSS, but not for fecal coliform; thus, only two of the three performance parameters have been tested for. Unless the manufacturer requests sample analysis for fecal coliforms, no comparable test data may exist to evaluate the system for fecal coliform reduction.

List of Systems Meeting Treatment Standards 1 and/or 2

The table on the following page identifies the currently approved sewage treatment systems and products that meet the criteria for Treatment Standard 1 and / or 2. Also listed are systems and products that meet the BOD_5 and TSS parameters but not the fecal coliform parameter of the standards. Local health officers may permit these two-criterion systems and products at marginal sites that would otherwise require Treatment Standards 1 or 2 ***if*** **additional treatment and/or effluent disinfection is provided to address the fecal coliform criteria of either standard.**

Experience with effluent disinfection of small on-site wastewater systems among those working in the on-site sewage system arena in Washington State is limited. Manufacturer product literature and R&D suggest that methods, equipment, and materials are readily available for reliable and effective disinfection of on-site sewage treatment system effluent. Conversely, anecdotal evidence suggests that currently available or chosen methods, equipment, and materials may be failing to meet expectations for reliability and effective disinfection to the levels required by Treatment Standard 1 and 2. In anticipation of nationally developed standards for disinfection equipment, DOH has written the interim document, Recommended Standards and Guidance for Disinfection Methods and Equipment.

Systems Meeting Treatment Standards 1 and/or 2			
Standard	**Performance level**	**Alternative System**	
		Domain Status	**System / Product**
Treatment Standard 1	**Meets or exceeds all parameters of the performance standard**	**Proprietary**	• **Glendon Bio Filter** • **TRD Wastewater Treatment Systems** • **Whitewater Aerobic Treatment Units in combination with the UV "The Disinfector" unit**
		Public Domain	• **Stratified Sand Filter**
	Meets or exceeds only BOD_5 and TSS parameters of the performance standard. Requires additional treatment to meet pathogen attenuation requirements.	**Proprietary**	• **Alternating Intermittent Recirculating Reactor-AIRR** • **Biomax Secondary Treatment System** • **Biomicrobics/FAST Wastewater Treatment Systems** • **Clearwater Ecological Systems** • **Clearstream Wastewater Systems CS1100 Spin Filter Assembly** • **Multi-Flo Waste Treatment Systems** • **Nayadic Residential Sewage Treatment System** • **Singulair Bio-Kinetic Wastewater Treatment System – 960 models** • **Whitewater Aerobic Treatment Unit**
		Public Domain	• **Intermittent Sand Filter** • **Recirculating Sand (Gravel) Filter**
Treatment Standard 2	**Meets or exceeds all parameters of the performance standard**	**Proprietary**	• **Glendon Bio Filter** • **TRD Wastewater Treatment Systems** • **Whitewater Aerobic Treatment Units in combination with the UV unit, "The Disinfector"**
		Public Domain	• **Intermittent Sand Filter** • **Stratified Sand Filter**
	Meets or exceeds only BOD_5 and TSS parameters of the performance standard. Requires additional treatment to meet pathogen attenuation requirements.	**Proprietary**	• **Alternating Intermittent Recirculating Reactor-AIRR** • **Biomax Secondary Treatment System** • **Biomicrobics/FAST Wastewater Treatment Systems** • **Clearwater Ecological Systems** • **Clearstream Wastewater Systems CS1100 Spin Filter Assembly** • **Multi-Flo Waste Treatment Systems** • **Nayadic Residential Sewage Treatment System** • **Singulair Bio-Kinetic Wastewater Treatment System – 960 models** • **Whitewater Aerobic Treatment Unit**
		Public Domain	• **Recirculating Sand (Gravel) Filter**

Experimental Systems

The Rules and Regulations of the State Board of Health for On-site Sewage Systems (Chapter 246-272 WAC) provide a means for evaluating and demonstrating experimental technologies. The Department of Health (DOH), with input from the Technical Review Committee (TRC), oversees testing and monitoring projects of this type. All experimental systems require DOH and local health officer approval, in that order. To assist local health officers in their review and permit issuance, DOH maintains a list of approved experimental systems. **Only systems so listed may be permitted by local health officers.**

Name of Applicant	System Type	Number of Application Sites	Status	County	Conditions of Approval
Mason	**Subsurface Flow Constructed Wetland**	1 Single family residence	Approved 9/29/98; state experimental permit expires 12/31/00	Whatcom	18 month system monitoring and wastewater sampling period with monthly monitoring and quarterly reporting.
Mesman	**Subsurface Flow Constructed Wetland**	1 Single family residence	Approved 12/31/98; system installed & monitoring began 10/00	Skagit	18 month system monitoring and wastewater sampling period with monthly monitoring and quarterly reporting.
Morse	**Subsurface Drip System**	30 Residential sites	Approved 10/29/98 with extension on system installation given to 12/31/00	Thurston, Lewis, Pierce, Grays Harbor, Kitsap, or Mason Counties	18 month system monitoring period with monthly monitoring and quarterly reporting.
Backman	**Modified Mound System**	30 Residential sites	Approved 8/1/00	Spokane or Tri-County Health	2 year system monitoring period with quarterly monitoring and biannually reporting.

List of Approved Wastewater Tanks

Introduction

Prior to the effective date of the revised on-site sewage system rules, concrete septic tanks and pump chamber were reviewed and approved by individual local health departments / districts. Non-concrete tanks, such as fiberglass and polyethylene, were reviewed and approved by the Washington State Department of Health (DOH). With the revised rules, all wastewater tanks, regardless of the their construction materials or methods, are subject to review and approval by DOH.

In anticipation of this expanded role, DOH has, with assistance from a volunteer committee representing public and private sector interests, been developing comprehensive standards for wastewater tanks. These standards are under development. As they are not yet available, and some time must be allowed for manufacturers to submit their tanks for review and approval, DOH has opted to develop a List of Approved Septic Tanks. This list, presented in the following pages, reflects information gathered from local health departments / districts.

This interim list is a continually evolving document and may not contain all tanks in current use in a given county. DOH has attempted in the past to contact all counties to obtain this information. Local health jurisdictions may add or make corrections by contacting the department.

Since this is a statewide list, all tanks contained on the list are currently acceptable to DOH. It should be noted that many local health departments do not have a formal process for evaluating wastewater tanks and caution is advised for use in any county other than where the tank is listed.

All these tanks will be required to undergo a formal review process under new DOH wastewater tank standards after they are adopted. This interim list will be revised as necessary to reflect tanks that have met the new standards or tanks deleted for failure to meet the DOH standards. If you have any questions regarding this list, or septic tank approvals, please contact Richard Bensen at (509) 456-6177, Fax number (509) 456-2997.

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Adams	M-1 Tanks 440 Rainier view Lane Moses Lake, WA 98837	One…… Two…… Two……	670 (pump) 1,000 (septic) 1,250 (septic)
Asotin-Garfield	Early Bird Supply, Inc 1508 15th Street Clarkston, WA 99403 (509) 758-3333	One…… Two……	1,000 (pump) 1,000
Benton-Franklin	ATTN: John Dalrymple Bert's Excavating PO Box 73 Sunnyside, WA 98944	Two……	1,000 (1 piece)
	ATTN: Bob Nichols Ground Level Construction Route 3, Box 650 East Selah Road Yakima, WA 98901	Two……	1,000
	ATTN: Rick Murphy J & K Tanks Route 1, Box 1019 Prosser, WA 99350	Two…… Two……	1,000 (2 piece) 1,000 (1 piece) -currently under review
	ATTN: Doyle Pegram Pegram and Son's Constr. PO Box 418 Othello, WA 99344	Two…… Two……	1,000 (1 piece) 1,250 (1 piece)
	ATTN: Elmer Rada Rada and Sons, Inc. 2707 East Lewis Pasco, WA 99301	Two…… Two…… Two…… Two ……	1,100 (2 piece) 1,600 (2 piece) 1,100 (1 piece) 1,620 (1 piece)
	ATTN: Steven Landon Reese Concrete Products, Inc. 1606 South Ely Kennewick, WA 99336	Two…… Two…… Two……	1,000 (2 piece) 1,000 (1 piece) 1,500 (1 piece)
	Selah Concrete Products 319 South First Street Selah, WA 98942	Two…… Two……	1,000 (1 piece) 1,250 (1 piece)
	ATTN: Wayne Thompson Thompson's Precast Septic Tanks Route 1, Box 1004 Granger, WA 98932	Two……	1,000 (2 piece)

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Bremerton-Kitsap	Central Redi Mix (Delzotto) 1836-B Carpenter Road NE Olympia, WA 98506		
	Kurt's Precast, Inc. PO Box 99 Belfair, WA 98528-0099 Tel: (360) 427-6040	One…… Two……	1,125 (pump) 1,125 (septic)
	Fred Hill Materials PO Box 6 Poulsbo, WA 98370 (360) 779-4431	One…… One…… Two……	500 (pump) 1,125 (pump) 1,125 (septic)
	Northwest Cascade PO Box 73399 Puyallup, WA 98373	One…… One…… Two……	500 (pump) 1,125 (pump) 1,125 (septic)
	Stuth Company 28260 Maple Valley Road SE Maple Valley, WA 98038		
Chelan-Douglas	Godbey Red-E-Mix Concrete, Inc 912 SW Ansel Brewster, WA 98812	Two…… Two……	1,000 1,250
	H2 Precast Concrete Products PO Box 3568 Wenatchee, WA 98807	One…… Two…… Two…… Two……	750 (pump) 1500 (septic) 1,000 1,250
	ATTN: John Wood Quality Construction PO Box 39 Wenatchee, WA 98801	Two…… Two……	1,000 1,500
Clallam	Peninsula Septic Tanks 1370 Woodcock Road Sequim, WA 98382 (360) 683-4714	One…… Two…… Two…… Two…… Two……	750 (pump) 1,000 1,250 1,500 2,000
Columbia	NOT PROVIDED		
Cowlitz	NO CONCRETE TANKS ON LIST		
Grant	M-1 Tanks 440 Rainier View Lane Moses Lake, WA 98837	One…… Two…… Two……	670 (pump) 1,000 1,250

List of Approved Concrete Septic Tanks and Pump Chambers			
County	**Manufacturers**	**Number of Compartments**	**Liquid Capacity (gallons)**
Grays Harbor	Atlas Concrete Products, Inc. 19221 Sargent Road Rochester, WA 98579	Two……	1,200 (septic)
	Central Reddi-Mix, Inc. 1419 Bishop Road Chehalis, WA 98532	One…… Two……	750 (pump) 1,150 (septic)
	Evergreen Concrete Products 13212 Valley Ave. E Sumner, WA 98390	One…… Two……	750 (pump) 1,100 (septic)
	Northwest Cascade, Inc. 16207 Meridian Road Puyallup, WA 98373	Two……	1,125 (septic)
Island	Berg Vault Company 1671 Cederdale Road Mt. Vernon, WA 98273 (360) 424-4999	Not provided	1,000 1,250 1,750
	Cuz Concrete Products 19521 63rd Avenue NE Arlington, WA 98223 (360) 435-5650	Not provided	1,000 1,250 1,500
	Everett Bros. Construction Co. PO Box 761 Oak Harbor, WA 98277 (360) 675-2727	Not provided	1,000
	Pacific Pre-Cast PO Box 1761 Oak Harbor, WA 98277 (360) 679-0702 (360) 675-9560	Not provided	1,000
	Stanwood Redi-Mix 2431 Larson Road Stanwood, WA 98292 (360) 652-7777	Not provided	1,000 1,200
	Whidbey Island Sand and Gravel PO Box 434 Freeland, WA 98249 (360) 321-6101	Not provided	1,000
	William Crane & Precast PO Box 638 Freeland, WA 98249 (800) 755-5506	Not provided	1,000 1,250

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Jefferson	Cotton Ready Mix	One…… Two……	700 (pump) 1,000
Kittitas	Evergreen Precast PO Box 58 Sumner, WA 98390 (206) 863-6510	Two…… Two……	1,000 1,500
	ATTN: Larry Haven H2 Precast Concrete Products, Inc PO Box 3568 Wenatchee, WA 98807 (360) 884-6644	Two…… Two……	1,000 1,250
	M-1 Tanks 440 Rainier View Lane Moses Lake, WA 98837 (509) 766-2914	Two……	1,000
	Panhandle Concrete 675 West Dalton Avenue Coeur d'Alene, ID 83814 (208) 667-8179	Two……	1,000
	Selah Concrete Products 319 South First Street Selah, WA 98942 (509) 697-4755	Two…… Two……	1,000 1,250
	Sno-Valley Concrete Products 19401 State Road Monroe, WA 98272 (206) 788-5686	Two……	1,000
	Stuth Company PO Box 950 Maple Valley, WA 98038 (206) 255-3546	Two……	1,000
	Spokane Wilbert Vault Co. 1323 North Cedar Street Spokane, WA 99201-2795 (509) 325-4573	Two…… Two…… Two……	1,000 2,000 2,500
	Yakima Precast, Inc. 1210 South First Street, Suite #104 Yakima, WA 98901 (509) 248-1984	Two……	1,000

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Lewis	Atlas Concrete Products 19221 Sargent Road Rochester, WA 98579 (360) 354-3912	Not provided	
	Central Reddi Mix, Inc. 305 East Summa Centralia, WA 98531 (360) 736-1131	Not provided	
	Northwest Cascade PO Box 73399 Puyallup, WA 98373	Not provided	
	Roto-Tech 201 Carlisle Coos Bay, OR 97420	Not provided	
Lincoln	Godbey Red-E-Mix Concrete, Inc 912 SW Ansel PO Box 505 Brewster, WA 98812 (509) 689-2415	Two…… Two……	1,000 1,250
	M-1 Tanks 440 Rainier View Lane Moses Lake, WA 98837 (509) 766-2914	Two……	1,000
	Spokane Wilbert Vault Co. 1323 North Cedar Street Spokane, WA 99201-2795 (509) 325-4573	Two…… Two…… Two…… Two…… Three……	1,000 1,500 2,000 2,500 1,500
	White Block Co. 6219 East Trent Spokane, WA 99212 (509) 534-0651	Two…… Two…… Two…… Two…… Three……	1,000 1,500 2,000 2,500 1,500

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Mason	NOT PROVIDED		
NE Tri-County: ***Ferry, Stevens, Pend Oreille)***	Coville Valley Concrete Corp. 1175 East 3rd Colville, WA 99114 (509) 684-2534	One…… Two…… Two…… Two …… Three……..	1,500 (mono) 500 (mono-pump) (Note: "mono" means monolithic pour.) 1,000 (2 piece) 1,000 (mono) 1,500 (mono)
	Godbey Red-E-Mix Concrete, Inc 912 SW Ansel PO Box 505 Brewster, WA 98812 (509) 689-2415	Two…… Two……	1,000 1,250
	Spokane Wilbert Vault Co. 1323 North Cedar Street Spokane, WA 99201-2795 (509) 325-4573	Two…… Two…… Two…… Two…… Three……	1,000 1,500 2,000 2,500 1,500
	Toner's Sand & Gravel East 4611 Eloika Road Chattaroy, WA 99003 (509) 325-4573	Two……	1,250
	White Block Co. 6219 East Trent Spokane, WA 99212 (509) 534-0651	Two…… Two…… Two…… Two…… Three……	1,000 1,500 2,000 2,500 1,500

List of Approved Concrete Septic Tanks and Pump Chambers			
County	**Manufacturers**	**Number of Compartments**	**Liquid Capacity (gallons)**
Okanogan	Cascade Concrete Products, Inc. PO Box 2435 Winthrop, WA 98862 (509) 996-2435	One (oval)…….. One (oval)…….. Two (oval)…… Two (rectangle)….. Two (oval)……...	1,000 (pump) 1,250 (pump) 1,000 1,000 1,250
	Godbey Red-E-Mix Concrete, Inc 912 SW Ansel PO Box 505 Brewster, WA 98812 (509) 689-2415	One…….. One…….. Two…….. Two……..	1,000 (pump) 1,250 (pump) 1,000 1,250
	Okanogan Valley Concrete, Inc 2145 Elmway Okanogan, WA 98840 (509) 422-3211	One (round)…….. One (oval)…… One (rectangle)…… Two (oval)…… Two (rectangle)……	500 (pump) 1,000 (pump) 1,250 (pump) 1,000 1,250
	South Okanogan Concrete Products, LTD. Box 419 Osoyoos, B.C Canada VOH 1VO (604) 495-7556	One…….. One…….. One…….. One…….. Two…….. Two…….. Two……..	800 (pump) 1,000 (pump) 1,250 (pump) 1,500 (pump) 1,000 1,250 1,500
Pacific	Dennis Company Redi-Mix P.O. Box 891 Ilwaco, WA 98624 TEL: (360) 642-3153	One…….. One…….. Two……..	500 (pump) 1000 (pump) 1000 (septic)
San Juan	Berg Vault Company 1671 Cedardale Road Mt. Vernon, WA 98273 (360) 424-4999	Not provided	
	Cuz Concrete Products 19521 63rd Avenue NE Arlington, WA 98233 (360) 435-5650	Not provided	
	Island Concrete Products 1793-B Cattle Point Road Friday Harbor, WA 98250 (360) 378-5878	Not provided	
	Lopez Sand & Gravel Route 1, Box 2382 Lopez, WA 98261 (360) 468-2320	Not provided	
	Sea Island Sand & Gravel Route 1, Box 81-C Eastsound, WA 98254 (360) 376-4215	Not provided	

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Seattle-King			**Legend (Seattle-King):** **P = Pump tank** **S = Septic tank** **H = Holding tank**
	Campbell's Pre-Cast 11515 120th Street E Puyallup, WA 98373	Two……	890 (P) 1,125 (S,P,H)
	Cuz Concrete Products 19521 63rd Avenue NE Arlington, WA 98233 (360) 435-5650	Two…… Two…… Two……	1,000 (S,P,H) 1,250 (S,P,H) 1,500 (S,P,H)
	Evergreen Precast PO Box 58 Sumner, WA 98390 (206) 863-6510	One…… Two……	1,100 (S,P,H) 730 (P) 1,500 (P,H) 1,500 (S,P,H)
	Northwest Cascade PO Box 73399 Puyallup, WA 98373	Two……	1,125 (S,P,H)
	Puget Sound Concrete PO Box 412 Bothell, WA 98041	Two……	750 (P) 1,000 (S,P,H)
	Quality Concrete Products PO Box 1703 Woodinville, WA 98072	Two……	1,000 (S,P,H)
	Sno-Valley Concrete 19401 State Route 203 Monroe, WA 98272	Two……	750 (P) 1,000 (S,P,H)
	Stuth Company PO Box 950 Maple Valley, WA 98038 (206) 255-3546	Two…… 1-2-3….....	750 (P) 1,000 (S,P,H) 1,750 (S,P,H)
	Sunset Septic Tank 918 South Central Kent, WA 98031	Two…… One……	1,000 (S,P,H) 1,000 (S,P,H)

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Skagit	ATTN: Kim & Norman Schultz Berg Vault Company 1671 Cederdale Road PO Box 1205 Mt. Vernon, WA 98273 (360) 424-4999	One…… One…… Two……	400 (pump) 750 (pump) 1,000
	Concrete Nor'west 1031 Hampton Road Lynden, WA 98264 (360) 364-3243		
	Cuz Concrete Products 19521 63rd Avenue NE Arlington, WA 98233 (360) 435-5650	One……	1,000
	Everett Brothers Ready-Mix, Inc. 3651 State Hwy 20 Oak Harbor, WA 98277 (206) 657-2727 (206) 675-2215	One……	1,000
	ATTN: Doug Tacia Pacific Precast PO Box 1761 Oak Harbor, WA 98277 (360) 679-0702 (360) 678-5617	One…… Two……	600 (Pump) 1,000
	Stanwood Redi-Mix 2431 Larson Road Silvana, WA 98287 (360) 652-7886 (360) 652-7777	Two…… Two…… One……	1,000 1,250 120 (pump)

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Snohomish	ATTN: Norman Schultz Berg Vault Company PO Box 1205 1671 Cederdale Road Mt. Vernon, WA 98273 (360) 424-4999	Not Provided	750 (pump) 1,000
	ATTN: Joe Zachry Cuz Concrete Products 19521 63rd Avenue NE Arlington, WA 98233 (360) 435-5650	Not Provided	750 (pump) 1,000 (septic/pump) 1,250 (septic/pump) 1,500 (septic/pump)
	ATTN: Dave Soloman Sno-Valley Concrete Products, Inc. 19401 State Route 203 Monroe, WA 98272	One…… One…… Two……	750 (pump) 1,000 (pump) 1,000 (septic)
	ATTN: Kim Schultz Stanwood Redi-Mix PO Box 68 2431 Larson Road Silvana, WA 98287 (360) 652-7886 (360) 652-7777	One…… Two……	750 (pump) 1,000
	Stuth Company PO Box 950 Maple Valley, WA 98038 (206) 255-3546	Not Provided	750 (pump) 1,000 (septic/pump) 1,750 (septic/pump)

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Southwest: ***Clark, Skamania, Klickitat***	Atlas Tanks Distributor: Cuz Concrete Products 19521 63rd Avenue NE Arlington, WA 98233 (360) 435-5650	Two…… Two…… Two……	1,000 1,250 1,500
	D & K 15008 NE 15th Avenue Vancouver, WA 98665 (360) 573-4020	1,000 1,250 1,500	1,000 1,250 1,500
	Home & Farm Concrete 2625 NE Goodwin Road Camas, WA 98607 (360) 696-3789	Two…… Two…… Two……	1,000 1,250 1,500
	Michaels Precast 35125 SE Highway 211 Boring, OR 97009 (541) 668-4073	Two……	1,000
	Rick Murphy S & K Tanks Route 1, Box 1019 Prosser, WA 99350	Two……	1,000
	Riley Brothers Concrete, Inc. PO Box 718 Bingen, WA 98805	Two…… Two……	1,000 1,250
	Sound Redi Mix CRI Engineering 4562 Westside HWY Castle Rock, WA 98661 Tel: (360) 507-4311 Fax: (360) 274-5355	Three……	2,633
	Willamette Greystone, Inc. 2405 NE 244th Ave. Portland, OR 97060 (503) 669-7612	Two…… Two…… Two…… Two…… Two	1,000 1,250 1,500 2,000 3,000

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Spokane	Custom Excavating	Two……	1,000
	Newport Concrete	Two……	1,000
	Panhandle Concrete Products	Two……	1,000
	ATTN: Scott Erickson Spokane Wilbert Vault Co. 1323 North Cedar Street Spokane, WA 99201-2795 (509) 325-4573	Two…… Two…… Two…… Two…… Three……..	1,000 1,500 2,000 2,500 1,500
	ATTN: Larry Toner Toner's Sand & Gravel East 4611 Eloika Road Chattaroy, WA 99003 (509) 325-4573	Two…… Two……	1,000 1,000 (Delzotto)
	White Block Co. 6219 East Trent Spokane, WA 99212 (509) 534-0651	Two…… Two…… Two…… Two…… Three……..	1,000 1,500 2,000 2,500 1,500

List of Approved Concrete Septic Tanks and Pump Chambers			
County	**Manufacturers**	**Number of Compartments**	**Liquid Capacity (gallons)**
Tacoma - Pierce	Evergreen Precast PO Box 58 Sumner, WA 98390 (206) 863-6510	One…… One…… One…… One…… Two……	750 1,000 1,500 1,000 1,500
	Northwest Cascade PO Box 73399 Puyallup, WA 98373	One…… One…… One……	1,500 1,000 1,500
	Stuth Company PO Box 950 Maple Valley, WA 98038 (206) 255-3546	Not provided	750 1,000 1,750
	White's Inc. 8914 Villa Beach RD Anderson Island, WA 98303	Two……..	1,000
Thurston	ATTN: Rod Liseth Atlas Concrete Products 19221 Sargent Rochester, WA 98579 (360) 354-3912	One…….. One……... One…….. Two…….. Two……..	400 800 1,150 1,150 1,200
	ATTN: Jim Campbell, Jr. Campbell Pre-Cast Concrete PO Box 1522 Graham, WA 98388	Two…….	1,000
	ATTN: Tom Brakken Central Redi-Mix 1836-B Carpenter Road NE Olympia, WA 98506	One……... One……... Two……..… Two……	800 380 1,150 1,200
	Evergreen Pre-Cast PO Box 58 Sumner, WA 98390	Two……...	1,100
	ATTN: Dave Turgeon Northwest Cascade PO Box 73399 Puyallup, WA 98373	Two……... Two……	1,125 1,150
	Stuth Company, Inc. PO Box 950 Maple Valley, WA 98038 (206) 255-3546	One……... Two…… Nibbler……	750 1,000 1,750

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Wahkiakum	NOT PROVIDED		
Walla Walla	Koncrete Industries 1360 Dell Avenue Walla Walla, WA 99362	Not provided	1,200
	Rada & Sons 15 East Ice Harbor Drive Pasco, WA 99301	Not provided	1,000 1,600
	Reese Concrete Products 1606 South Ely Kennewick, WA 99337-2899	Not provided	1,000 1,600
	Selah Concrete Products 319 South First Avenue Selah, WA 98942	Not provided	1,000 1,250
Whatcom	Bode's Precast 144 River Road Lynden, WA 98264	Not provided	750 900 1,000 1,250 1,500 500 (pump)
	Vanderveen Precast 8077 Guide Meridian Lynden, WA 98264	Not provided	750 900 1,000 1,250 1,500 500 (pump)
Whitman	NOT PROVIDED		

List of Approved Concrete Septic Tanks and Pump Chambers

County	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Yakima	Bert's Precast Septic Tanks 1506 Sunnyside-Mabton Road Sunnyside, WA 98944 Tel: (509) 837-2117 Fax: (509) 837-6282	One…….. Two……. Three……..	1,000 gallons 1,250 gallons 1,500 gallons 1,000 gallons 1,250 gallons 1,500 gallons 1,500 gallons
	Ground Level Construction 400 East Selah Road Yakima, WA 98901 (509) 575-1668	Not provided	
	Quick's Concrete Finishing 181 Quick Lane Zillah, WA 98953 (509) 865-4269 (509) 865-2710	Not provided	
	Selah Concrete Products 319 South First Avenue Selah, WA 98942 (509) 697-4755	Not provided	
	Spokane Wilbert Vault Co. 1323 North Cedar Street Spokane, WA 99201-2795 (509) 325-4573	Not provided	
	Valley Septic Services 903 Ahtanum Road Union Gap, WA 98903 Tel: (509) 248-6810 Fax: (509) 248-1608	Two…….	1,000 gallons 1,250 gallons
	Yakima Precast, Inc. 1210 South First Street Yakima, WA 98901 (509) 248-1984	Not provided	

List of Approved Non-Concrete Septic Tanks

Description	Manufacturers	Number of Compartments	Liquid Capacity (gallons)
Fiberglass	Fiber Septic Systems, Inc. Ninth and Harris Bellingham, WA 98225 (360) 733-6248	Two……	1,000 gallons 1,250 gallons (June 1992)
	Fiberglass Structures, Inc. (Distributor) 5101 Summitview Avenue Yakima, WA 98908-2858 (509) 965-8437		
	Western Industrial Laminations, LTD. 301 - 19837 Telegraph Trail Langley, BC CANADA V3A 4P8 (604) 986-8070	Two……	1,000 gallons 1,250 gallons 1,500 gallons 1,800 gallons 2,000 gallons (July 1995)
Polyethylene	NORWESCO PO Box 439 St. Bonifacius, MN 55375-0439	Two……	1,000 gallons 1,250 gallons 1,500 gallons (March 1992)
	Premier Plastics, Ltd. Unit 107 - 917 Cliveden Avenue Delta, B.C. CANADA V3M 6E8 (604) 952-6686	One…… (Model PCU 760 "Saturna") Two……	760 gallons 1,300 gallons (July 1995)
	Quadel Industries, Inc. PO Box 1047 Coos Bay, OR 97420 (541) 269-7351	Two Two	1,000 gallons (January 1985) 1,250 gallons 1,500 gallons
	Roto Tech Industries 201 Carlisle Coos Bay, OR 97420 (541) 267-4804		1,250 gallons (Sep. 1991) 1,000 gallons (Feb. 1992)